Claims

[c1] 1.An electrochemical cell system, comprising:
an electrochemical cell stack;
a fluid containment vessel comprising a vessel inlet in fluid communication with a stack outlet and a vessel outlet in fluid communication with a stack inlet, wherein the vessel inlet comprises an inlet control device, and wherein the outlet comprises an outlet control device; and
a load cell disposed in operable communication with the fluid containment vessel.

[c2] 2.The system according to Claim 1, further comprising a second load cell disposed in operable communication with the fluid containment vessel.

[c3] 3. The system according to Claim 1, wherein the load cell comprises a compressive force measurement device for measuring a weight of the fluid containment vessel.

[c4] 4.The system according to Claim 1, wherein the load cell comprises a tensile force measurement device for measuring a weight of the fluid containment vessel.

[c5] 5.The system according to Claim 1, further comprising a float translatably disposed in the fluid containment vessel.

[c6] 6.A process for calibrating a liquid volume control system, comprising:
draining liquid from a fluid containment vessel such that the vessel is substantially empty and generating a first signal, wherein the first signal is a measurement of the weight of the vessel;
filling the vessel with liquid such that the vessel is substantially full of liquid and generating a second electrical signal, wherein the second electrical signal is a measurement of the vessel and the liquid contained therein; and
calculating a lower weight limit and an upper weight limit based on the first electrical signal and second electrical signal.

[c7] 7.The process according to Claim 6, further comprising recording the first signal and the second signal in a memory device of a microprocessor, wherein

the microprocessor calculates the lower weight limit and the upper weight limit.

[c8] 8. The process according to Claim 6, wherein generating a first signal further comprises generating an electrical signal with a load cell in operable communication with the vessel.

[c9] 9.The process according to Claim 6, wherein the first signal and the second signal selected from the group consisting of hydraulic signals, electrical signals, pneumatic signals, and optical signals.

[c10] 10.The process according to Claim 6, wherein filling the vessel with liquid comprises introducing a stream from an electrochemical cell into the vessel.

[c11] 11.A method for operating an electrochemical system, comprising:
producing a stream comprising water and a gas in an electrochemical cell stack;
introducing the stream to a fluid vessel;
monitoring a measured weight of the vessel; and
maintaining the measured weight of the vessel between an upper weight limit and a lower weight limit by at least one of ceasing the introduction of the stream to the fluid vessel, introducing the stream to the fluid vessel, and removing liquid from the fluid vessel.

[c12] 12.A method according to Claim 11, further comprising introducing feed water to an electrolysis cell stack; producing hydrogen and oxygen; and removing the stream from a hydrogen side of the electrolysis cell stack.

[c13] 13.A method according to Claim 11, further comprising introducing oxidant and hydrogen to a fuel cell; producing water and electricity; and directing the stream from an oxidant side of the fuel stack.

[c14] 14.A weight sensing system, comprising:
a containment vessel;
a first conduit in fluid communication with the containment vessel, wherein the first conduit comprises a first flow control device;
a second conduit in fluid communication with the containment vessel, wherein the second conduit comprises a second flow control device; and

a load cell in operable communication with the containment vessel, first flow control device, and second flow control device.

[c15] 15.The system according to Claim 14, wherein a plurality of load cells are in operable communication with the containment vessel.

[c16] 16.The system according to Claim 15, wherein the load cell comprises a compressive force measurement device for measuring a weight of the fluid containment vessel.

[c17] 17.The system according to Claim 15, wherein the load cell comprises a tensile force measurement device for measuring a weight of the fluid containment vessel.

[c18] 18.The system according to Claim 14, wherein the load cell is disposed generally normal to the containment vessel.

[c19] 19.The system according to Claim 14, further comprising a controller disposed in operable communication with the load cell, the first control device, and the second control device.

[c20] 20.The system according to Claim 14, further comprising a float translatably disposed in the containment vessel responsive to a level of a liquid contained in the containment vessel.

[c21] 21.A process for controlling a liquid level in a fluid vessel, comprising:
introducing a liquid to the vessel;
monitoring a measured weight of the vessel; and
maintaining the measured weight of the vessel between an upper weight limit and a lower weight limit.

[c22] 22.The process according to Claim 21, further comprising determining the upper weight limit by filling the vessel with the liquid and obtaining a filled vessel signal from a load cell, and determining the lower weight limit by draining the liquid from the vessel and obtaining an empty vessel signal from the load cell.

[c23] 23.The process according to Claim 22, wherein the filled vessel signal and the empty vessel signal are selected from the group consisting of hydraulic signals, electric signals, pneumatic signals, and optical signals.

[c24] 24. The process according to Claim 22, further comprising storing the filled vessel signal and the empty vessel signal in a controller.

[c25] 25.The process according to Claim 24, wherein the controller contains a nonvolatile memory device.